Federal Democratic Republic of Ethiopia

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ET 5263.ISO.1.DS (2012) (English): Pulps -- Laboratory wet disintegration, Part 1: Disintegration of chemical pulps

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ETHIOPIAN
STANDARD

ES ISO 5263-1:2012

First edition

Pulps — Laboratory wet disintegration —

Part 1:
Disintegration of chemical pulps

ICS: 85.040

Published by Ethiopian Standards Agency

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for paper and pulp Products (TC 3) and published by the Ethiopian Standards Agency (ESA).

The standard is identical with ISO 5263-1:2004 Pulps — Laboratory wet disintegration — Part 1: Disintegration of chemical pulps published by ISO 2004.

For the purpose of this Ethiopian Standard, the adopted text shall be modified as follows.

- The phrase “International Standard” shall be read as “Ethiopian Standard”; and
- A full stop (.) shall substitute comma (,) as decimal marker.

Pulps — Laboratory wet disintegration —

Part 1:
Disintegration of chemical pulps

1 Scope

This part of ISO 5263 specifies an apparatus and the procedure for the laboratory-wet disintegration of chemical pulps. This apparatus and procedure are required for preparation of the test portion in a number of other International Standards dealing with pulps.

In principle, this method is applicable to all kind of chemical pulps, including recovered fibres. It is not suitable for mechanical pulps and some very long-fibred chemical pulps such as those from cotton and similar materials.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 638, *Pulps — Determination of dry matter content*

ISO 4119, *Pulps — Determination of stock concentration*

ISO 14487, *Pulps — Standard water for physical testing*

3 Definition

For the purposes of this part of ISO 5263, the following definition applies.

3.1
disintegration of chemical pulp
mechanical treatment in water so that interlaced fibres, which were free in the pulp stock, are again separated from one another without appreciably changing their structural properties

4 Apparatus

Ordinary laboratory apparatus and the following:

4.1 Standard disintegrator, as described in Annex A.

NOTE The procedure for checking the Standard disintegrator is given in Annex B.

4.2 Balance, capable of weighing with an accuracy of ± 0,2 g.

4.3 Standard water, for physical testing, as specified in ISO 14487.

5 Preparation of test portion

Mechanical, semi-chemical and chemi-mechanical pulps shall be disintegrated according to the procedure described in Part 2 or Part 3 of ISO 5263. All pulps which exhibit latency must be disintegrated according to the procedure described in ISO 5263-3.

If the pulp is wet or air-dry, determine the dry matter content in accordance with ISO 638. If the pulp is in slush form, determine the dry matter content in accordance with ISO 4119.

If the concentration of a slush pulp sample is less than 1,5 % by mass, thicken it to the appropriate volume, carefully avoiding the loss of fines. This is most easily done by sedimentation of the suspension and removing a part of the water phase or by dewatering through a filter paper on a Büchner funnel.

Use standard water (4.3) for disintegrating pulps to be used in tests where drainability properties are of importance, including laboratory beating. In all cases, use the same water quality as required in the procedure for which the pulp is disintegrated.

For each disintegration, take a test portion corresponding to a mass of (30,0 ± 0,5) g of oven-dry pulp. If the sample is in sheet-form, do not cut the sheets and avoid taking cut edges.

If the dry matter content is 20 % or more of the pulp, soak the test portion in 1 l to 1,5 l of water (standard water or other) at (20 ± 5) °C for at least the minimum soaking time specified in Table 1. If the pulp is in the form of sheets or slabs, after soaking tear the test portion into pieces with dimensions of approximately 25 mm × 25 mm. Soaking for a time longer than the minimum specified, for example overnight, has been found not to have any significant effect on the results. The soaking time shall, however, never be longer than 24 h for any pulp grade.

Table 1 — Recommended soaking time for chemical pulps

Dry matter content of the pulp, % by mass	**Minimum soaking time**
< 20	0 min
20 to 60	30 min
> 60	4 h

Where necessary for climatic reasons, a temperature of between 25 °C and 30 °C may be used, provided that this is stated in the test report.

6 Procedure

Transfer the test portion, after preparing as above, into the container of the Standard disintegrator (4.1).

Add water, of the same quality as used in Clause 5, at (20 ± 5) °C to give a volume of (2 000 ± 25) ml. Set the revolution counter to zero. Switch the motor on and allow the propeller to make the number of revolutions specified in Table 2. Stop the propeller and check visually that the pulp is completely disintegrated, for instance by diluting a small portion from the disintegrator with water in a glass cylinder and inspecting it under transmitted light. If it is not completely disintegrated, continue the disintegration until complete separation of fibres is achieved.

Table 2 — Recommended number of revolutions for chemical pulps

Dry matter content of the pulp % by mass	**Number of revolutions**
< 20	10 000
≥ 20	30 000

If for any reason a different pulp charge or a different number of revolutions is used, this shall be stated in the test report.

7 Test report

The test report shall include the following particulars:

a) reference to this part of ISO 5263 (e.g., ISO 5263-1:2004);

b) all the information necessary for complete identification of the sample;

c) the water grade (standard water, distilled water or tap water) used;

d) the soaking time;

e) the dry matter content of the sample;

f) any unusual features observed in the course of the test;

g) any operations not specified in this International Standard, or that are regarded as optional, which might have affected the results.

Annex A
(normative)

Construction of the Standard disintegrator

A.1 Materials

All components that come into contact with pulp suspensions shall be resistant to water and to dilute acids and alkalis. Stainless steel or glass-fibre-reinforced plastic material is normally used.

A.2 Standard disintegrator

The cylindrical container, Figure A.1, is fitted with four equally spaced spiral baffles extending between 32 mm from the bottom and 57 mm from the lid, each baffle traversing half the internal circumference of the container. The baffles spiral downwards in a clockwise direction. There is a fillet of radius 13 mm around the inside of the base of the container. The three-bladed propeller is mounted on a vertical shaft centrally in the container, at a fixed distance above the bottom. It is driven at the specified speed in the stock and a counter is fitted to record the number of revolutions. The counter should preferably be of the pre-set type, which will switch off the disintegrator after the required number of revolutions. Viewed from above, the propeller rotates in a clockwise direction.

The container is provided with a lid, which, in most disintegrators, is fitted to the propeller/motor assembly.

The container is fixed firmly in position during operation of the disintegrator, but it is capable of being removed and replaced easily and quickly.

A.3 Dimensions

Part	Dimension	Specified value (unless otherwise stated)	Tolerance
Container	internal height	191 mm	± 2 mm
	internal diameter	152 mm	± 2 mm
	radius of fillet	13 mm	± 2 mm
Baffles	square section	6,5 mm	± 1 mm
	height from container base	32 mm	± 1 mm
	distance from rim	57 mm	± 1 mm
	ends radiused	3 mm	± 0,5 mm
	edges radiused	0,4 mm	± 0,1 mm
	spacing (centres)	51 mm	± 1 mm
Propeller	diameter of swept circle at tip of blades	90 mm	± 0,5 mm
	diameter of hub	W 22 mm	—
	distance between propeller blades and container base (lowest point)	25 mm	± 2 mm
Propeller blades	width at hub	18,2 mm	± 0,5 mm
	maximum width	22,5 mm	± 0,5 mm
	thickness	1,6 mm	± 0,5 mm
	edges radiused	0,8 mm	± 0,2 mm
	ends radiused	4 mm	± 1 mm
Propeller shaft	diameter	u 20 mm	± 15'
	end taper	to fit any propeller hub	

A.4 Rotational frequency

The rotational frequency of the propeller shaft is (49,0 ± 1,5) s^{-1}.

Dimensions in millimetres

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Creator:
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Preview:
This EPS picture was not saved
with a preview included in it.
Comment:
This EPS picture will print to a
PostScript printer, but not to
other types of printers.

Key

1 6,5 mm × 6,5 mm section
2 end R 3
3 round edges R 0,4
4 four baffles, each a half-turn around the container (three shown)

[a] Not to scale.

Figure A.1 — Standard disintegrator details

Annex B
(normative)

Checking the Standard disintegrator

Check the Standard disintegrator regularly. Special care shall be taken to ensure that

a) the propeller shaft rotates smoothly and is always centred with respect to the container;

b) the propeller runs at the specified rotational frequency;

c) the propeller blades are set as specified (this may be checked by means of a propeller gauge);

d) the dimensions of the propeller blades are as specified (see A.3) and the propeller blades are not damaged.

If the apparatus is used properly, the other dimensions of the Standard disintegrator should remain constant; they shall, however, be checked at intervals.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

More Information?
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